

What is claimed is:

1           1.       A light projection apparatus comprising:  
2           a light source adapted to project illumination along a light path;  
3           dynamic patterning means interposed within the light path for forming a light pattern;  
4       and  
5           steering means within the light path for directing the light pattern in a desired one of a  
6       plurality of controllable directions.

1           2.       The apparatus of claim 1, wherein the light source includes a plurality of LEDs  
2       of at least a first color and a second color adapted to provide light along the light path common  
3       to said LEDs.

1           3.       The apparatus of claim 2, wherein the plurality of LEDs includes a third color  
2       adapted to provide light along a light path common to said LEDs.

1           4.       The apparatus of claim 3, wherein the first color LED, second color LED and  
2       third color LED are respectively a first primary color LED, a second primary color LED, and a  
3       third primary color LED.

1           5.       The apparatus of claim 2, further including intensity control means for  
2       controlling the intensity of the first color and the second color of the plurality of LEDs  
3       independently of one another.

1           6.       The apparatus of claim 1, wherein the dynamic patterning means includes:  
2           a transmissive LCD matrix interposed within the light path, said matrix comprised of a  
3       plurality of pixels; and  
4           means for selectively actuating the pixels to form a pattern, said pattern preventing light  
5       received from said LEDs from continuing along said light path and through said pixels forming  
6       said pattern to thereby form a light pattern inversely related to said pattern.

1           7.       The apparatus of 6, further including memory means having a plurality of  
2       different patterns stored therein.

1           8.       The apparatus of claim 6, wherein said means for selectively actuating the pixels  
2 includes means for addressing each pixel of the transmissive LCD matrix with two or more bits  
3 of data so that each pixel is capable of passing a partial amount of light from the light source.

1           9.       The apparatus of claim 8, wherein the transmissive LCD is a grayscale LCD.

1           10.      The apparatus of claim 2 wherein the patterning means includes:  
2           a wheel having a plurality of pattern windows formed along a periphery of the wheel;  
3           and  
4           a wheel axis on which the wheel is mounted for rotational movement around the axis to  
5 thereby present one of the plurality of pattern windows within the light path.

1           11.      The apparatus of claim 1, wherein the steering means includes a mirror having a  
2 central axis at an oblique angle to the light path.

1           12.      The apparatus of claim 11, further including means for tilting the mirror in a first  
2 axis transverse to the mirror axis.

1           13.      The apparatus of claim 12, further including means for tilting the mirror in a  
2 second axis transverse to the mirror axis and the first axis.

1           14.      A light projection apparatus comprising:  
2           a plurality of LEDs of at least a first color and a second color adapted to provide light  
3 along a light path common to said LEDs;  
4           intensity control means for controlling the intensity of the first color and the second  
5 color of the plurality of LEDs independently of one another;  
6           a transmissive LCD matrix interposed within the light path, said matrix comprised of a  
7 plurality of pixels;  
8           means for selectively actuating the pixels to form a pattern, said pattern preventing light  
9 received from said LEDs from continuing along said light path and through said pixels forming  
10 said pattern to thereby form a light pattern inversely related to said pattern;  
11          a mirror interposed within the light path to intercept said light pattern and having a  
12 mirror axis at an oblique angle to said light path; and

13 steering means for changing the oblique angle of the mirror axis relative to said light  
14 path.

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1 15. The apparatus of claim 14, wherein the plurality of LEDs includes a third color  
2 adapted to provide light along a light path common to said LEDs.

1 16. The apparatus of claim 15, wherein the first color LED, second color LED and  
2 third color LED are respectively a first primary color LED, a second primary color LED, and a  
3 third primary color LED.

1 17. The apparatus of claim 14, wherein said means for selectively actuating the  
2 pixels includes memory means having a plurality of different patterns stored therein.

1 18. A method for projecting light onto a projection surface comprising:  
2 directing light along a light path;  
3 displaying a selected one of a plurality of patterns on a display device interposed within  
4 the light path to form a light pattern;  
5 reflecting the light pattern off of a mirror in a first direction;  
6 moving the mirror; and  
7 reflecting the light pattern off of the mirror in a second direction.

1 19. The method of claim 18, further including:  
2 providing a plurality of LEDs capable of generating light along the light path of a first  
3 primary color, a second primary color, and a third primary color; and  
4 independently regulating the intensity of light output from the LEDs for each of the first,  
5 second, and third primary colors to yield colored light.

1 20. The method of claim 18, wherein the step of moving the mirror includes:  
2 tilting the mirror in a first mirror axis; and  
3 tilting the mirror in a second mirror axis transverse to the first mirror axis.

1 21. The method of claim 20, wherein the step of moving the mirror further includes  
2 rotating the mirror around a third mirror axis transverse to the first and second mirror axes.

